

are added.—Oppolzer gives the elements of Winnecke's comet (Comet III. 1870), and an ephemeris for every day, from Jan. 1 to March 1, 1875. The eclipse of the sun of October last was observed by H. Bruns and others at Dorpat; four telescopes were used, of 162, 97, 53, and 77 millimetres aperture respectively. It appears that the first contact was observed to take place earlier with the larger instruments than with the smaller; there is a difference of 44 seconds in time in the case of the 162 and 53 millimetre glasses. H. Bruns also contributes some remarks on the finding of the altitude of falling stars.—Dr. J. Uloletschek gives elements and an ephemeris for the planet Peitho (118) for the month of Dec.; and Ormond Stone adds a remark on certain equations in the determination of a comet's distance from the earth.—No. 2,017.—Dr. O. Lohse writes to the editor an account of the method of photographing the sun. He apparently uses collodion, containing chloride of silver, or paper, instead of the ordinary sensitive plate. He remarks that the process has the advantage of requiring no chemical preparation for each photograph, and he says the spots are sharply defined.—Prof. Bredichin sends his positions and observations of 22 of the minor planets, the comets of Winnecke, Borrelly, and Coggia; and Fearnley gives a list of 58 stars with their ascertained positions for comparison with Coggia's comet.—Leopold Schulhof gives elements and an ephemeris for the month of Dec. of Planet (139).—Victor Fuss gives the times of contact of four observers of the solar eclipse of October last.

THE *Bulletin de la Société d'Acclimatation de Paris* for September opens with a curious instance, related by M. Duwart, of a cross between the red and common grey partridge; the practical use of which, however, is not apparent, though it is a curious example of a cross between two species of birds hitherto regarded as irreconcilable.—M. La Perre de Roo contributes an article on Military Pigeons, which details the uses to which pigeons may be put for military purposes. Russia, Italy, Austria, and Germany have already created establishments for the breeding and training of pigeons with this object.—M. J. Bech pleads the cause of the small birds in France, most of which, as soon as the legal shooting season commences, are killed in large numbers by sportsmen who cannot find better game. He recommends the absolute prohibition of the slaughter of insectivorous birds.—The acclimatisation of sponges is the latest idea of one of the members of the society, who suggests that the celebrated Syrian sponges might be cultivated in the South of France.—The Notes from America include observations on the Mexican Agave, the introduction of mahogany into India, and the tea-productions of that country.

Der *Zoologische Garten*.—In the November number Dr. von Olfers discusses the food of the Stork (*Ciconia alba*), and its consequent value to the farmer. He finds the principal items of its bill of fare to consist of frogs, moles, grasshoppers, and the larger carabine beetles.—Dr. Dorner reviews the twelve species of Deer now represented in the Hamburg Zoological Gardens; a Stag (*Cervus elaphus*), aged only two years, has already antlers with twelve points.—H. Thienemann remarks on the habits of the Little Bustard (*Otis tarda*), which has recently established itself as a breeding species in Thuringia, as has also the Fieldfare (*Turdus pilaris*).—Among the remaining articles are notes on *Plotus levaillantii*, by H. Marno; and on *Tropidonotus tessellatus*, by H. Geisenheyner.

SOCIETIES AND ACADEMIES

LONDON

Geological Society, Dec. 16.—Mr. John Evans, F.R.S., president, in the chair.—The following communications were read:—(1) Descriptions of the Graptolites of the Arenig and Llandeilo Rocks of St. David's, by Messrs. John Hopkinson and Charles Lapworth. Commencing with a brief historical account of the discovery of graptolites in the neighbourhood of St. David's, from their first discovery in the Llandeilo series in 1841 by Sir Henry De la Beche and Prof. Ramsay, the authors proceeded to explain their views on the classification of the graptolites (*Graptolithina*, Bronn), which they place under the order *Hydroidea*, dividing them into two groups: *Rhabdophora* (Allman), comprising the true suctile or virgulate graptolites, which they consider to have been free organisms; and *Cladophora* (Hopkinson), comprising the dendroid graptolites and their allies, which were almost certainly fixed, and are most nearly allied to the recent

Thecaphora. The distribution of the genera and species in the Arenig and Llandeilo rocks of St. David's was then treated of, and the different assemblages of species in each of their subdivisions were compared with those of other areas. The Arenig rocks are seen to contain a number of species which ally them more closely to the Quebec group of Canada than to any other series of rocks, all their sub-divisions containing Quebec species, while the Skiddaw slates, which before the discovery of graptolites in the Lower Arenig rocks of Ramsey Island in 1872 were considered to be our oldest graptolite-bearing rocks, can only be correlated with the Middle and Upper Arenigs of St. David's. The graptolites of the Arenig rocks of Shropshire and of more distant localities were also compared with those of St. David's. In the Llandeilo series of this district the *Cladophora* have now for the first time been found, a few species, with several species of *Rhabdophora*, occurring at Abereiddi Bay in the Lower Llandeilo, which alone has been carefully worked, there being much more to be done in the Middle and Upper Llandeilo, from which very few species of graptolites have as yet been obtained. Some of the recently introduced terms, and altered or more definite terminology, employed in the descriptions of the species were then explained; and the paper concluded with descriptions of all the species of graptolites collected in the Arenig and Llandeilo rocks of St. David's within the last few years of which sufficiently perfect specimens have been obtained, doubtful species being referred to in an appendix. Forty-two species were described, belonging to the following genera:—*Didymograptus*, *Tetragraptus*, *Clemagraptus* (gen. nov.), *Dicellograptus*, *Climacograptus*, *Diplograptus*, *Phyllograptus*, *Glossograptus*, and *Trigonograptus* (*Rhabdophora*); *Pilograptus*, *Dendograptus*, *Callograptus*, and *Dictyograptus* (*Cladophora*). (2) On the age and correlations of the plant-bearing series of India, and the former existence of an Indo-oceanic continent, by Mr. H. F. Blanford. In this paper the author showed that the plant-bearing series of India ranges from early Permian to the latest Jurassic times, indicating that, with few and local exceptions, land and freshwater conditions had prevailed uninterruptedly over its area during this long lapse of time, and perhaps even from an earlier period. In the early Permian there is evidence in the shape of boulder-beds and breccias underlying the lowest beds of the Talchir group of a prevalence of cold climate down to low latitudes in India, and, as the observations of geologists in South Africa and Australia would seem to show, in both hemispheres simultaneously. With the decrease of cold the author believed the flora and reptilian fauna of Permian times were diffused to Africa, India, and perhaps Australia; or the flora may have existed somewhat earlier in Australia, and have been diffused thence. The evidence, he thought, showed that during the Permian epoch, India, South Africa, and Australia were connected by an Indo-oceanic continent, and that the first two remained so connected, with at the utmost some short intervals, up to the end of the Miocene period. During the latter part of the time this continent was also connected with Mayalana. The position of the connecting land was said to be indicated by the range of coral reefs and banks that now exists between the Arabian Sea and West Africa. Up to the end of the Nummulitic epoch, except perhaps for short periods, no direct connection existed between India and Western Asia.

Zoological Society, Jan. 5.—Dr. E. Hamilton, vice-president, in the chair.—A letter was read from Dr. George Bennett, of Sydney, giving an account of an Indian beetle (*Chrysocroa ocellata*), which had been captured alive in the Bay of Bengal, 273 miles from the nearest land, by Capt. Payne, of the barque *William Mansoon*.—A letter was read from Mr. Anderson, of Futtreyghur, East Indies, giving an account of the eggs and young of the Gavial (*Gavialis gangeticus*).—The Secretary read a letter addressed to him by the Marquis of Normanby, Governor of Queensland, announcing that he had forwarded by the ship *Ramsay*, under the care of Capt. Carter, a fine specimen of the Australian Cassowary (*Casuarius australis*), as a present for the Society's collection.—A communication was read from Mr. A. G. Butler, giving descriptions of thirty-three new species of *Spingidae* in the collection of the British Museum.—A communication was read from Mr. Andrew Anderson, of Futtreyghur, giving corrections of and additions to a previous paper by him on the Raptorial Birds of North-western India (P.Z.S., 1872, page 619).—A communication was read from Mr. E. L. Layard, H.B.M. Consul for Fiji and Tonga, containing ornithological notes made in the Fijis, together with descriptions of some supposed new species of birds.

Royal Microscopical Society, Jan. 6.—Chas. Brooke, F.R.S., president, in the chair.—Dr. Ord read a paper on the natural history of the common urates, in which he described the results of a number of experiments with urates of soda and ammonia, carried on with a view to ascertain what was the meaning of the different forms in which they appeared in the animal system. The various forms assumed by these salts in colloid media, and under the action of acids or chlorides, were described at some length, and the subject was further illustrated by drawings and preparations exhibited in the room.—A paper by Dr. Pigott, on the invisibility of minute refractory bodies in consequence of excessive aperture, was read by the Secretary.—Some beautiful sections of a foraminifer (*Alveolina*), both transverse and longitudinal, mounted by Möller, were exhibited by the Assistant Secretary.

Royal Geographical Society, Jan. 12.—Sir Rutherford Alcock, vice-president, in the chair.—A letter was read from Lieutenant-Colonel C. C. Long, a staff officer in the Egyptian service, giving the Society an account of his recent journey to King Mtesa, on the shores of Lake Victoria Nyanza. According to Col. Long's account, he left Gondokoro on the 24th of April last, charged by Col. Gordon with a friendly mission to the powerful King of Uganda (King Mtesa), and accompanied by two Egyptian soldiers and two servants. The journey occupied fifty-eight days, at the end of which the party was rewarded by the sight of the richly-cultivated central district of Uganda, appearing like a great forest of bananas. King Mtesa received the envoy with great friendliness, and ordered thirty of his subjects to be decapitated in honour of the visit. Permission was given Col. Long to descend "Murchison Creek" and view Lake Victoria. The journey from Mtesa's residence occupied three hours, and the party embarked on canoes made of the bark of trees, sewn together. Col. Long sounded the waters of the lake, and found a depth of from 25 to 35 feet. In clear weather the opposite shore was visible, appearing "to an unnautical eye" from twelve to fifteen miles distant; he did not think he could possibly be greatly deceived in this estimate. After much negotiation and opposition, he obtained permission to return to Egyptian territory by water, and on the way, in lat 1° 30', discovered a second lake, or large basin, at least twenty to twenty-five miles wide. He found the Upper Nile from Ripon Falls to Karuma Falls a fine navigable stream large enough for the *Great Eastern*. He finally reported from Gondokoro (October 20) that Col. Gordon would soon have a steamer on Albert Nyanza, and intended also to move one to the Upper Nile above Karuma.—A paper was then read "On a Journey along the East Coast of Africa, from Dar-es-Salam to Kilwa, in December 1873, by Capt. F. Elton," the chief point of which was that the Rufiji River was found above the head of the delta to have an average depth of only four to five feet.—Major Erskine (late Colonial Secretary of Natal) then read a paper on his son's (Mr. St. Vincent Erskine) recent mission to the powerful Kaffir chief Umsila, whose territory stretches along the richly-wooded and fertile interior country between the Limpopo and the Zambezi. Umsila's head-quarters are near the ruins of Zimbaye, where the German traveller, Carl Mauch, discovered sculptured stones, supposed by some to be of great antiquity. Major Erskine stated that his son had just returned from a second visit to Umsila and Sofala.

PARIS

Academy of Sciences, Jan. 4.—M. Frémy in the chair.—The following papers were read:—Note on magnetism *d'après* of a recent communication by M. Lallemand, by M. Th. du Moncel.—Memoir on the resistance of protozoa to the different dressing materials employed in surgery, by M. Demarquay.—On the decomposition and preservation of wood, by M. Max. Paulet.—On the germination of the "Chevallier" barley, by M. A. Leclerc.—Communications relating to Phylloxera were received from MM. L. Roesler, G. Beaume, P. Jolly, and others.—The French Minister in China forwarded a despatch from M. Fleuriat, dating from Shanghai, Dec. 26, and announcing the successful result of the Transit of Venus observations.—The following letters from various observing stations were also read:—From MM. Ch. André and A. Angot, at Noumea, dated Oct. 8; from M. J. Janssen, at Nagasaki, dated Nov. 4; from M. Héraud, at Saigon, dated Nov. 22; and from M. P. Tacchini, at Muddapur (Bengal), dated Dec. 10. This last communication makes known that the spectroscopic observations of the Transit were satisfactory, and tend to show that the diameter

of the sun is smaller when seen in the spectroscope than when observed by the other method.—On the calculus of geodesic co-ordinates, by M. Ch. Trepied.—On the expression of work relative to an elementary transformation, by M. J. Moutier.—Analogies between the disengagement of gases from their super-saturated solutions and the decomposition of certain explosive bodies, by M. D. Gernez.—On the atomic structure of the molecules of benzene and terebene, by M. G. Hinrichs.—On the titanic ethers by M. E. Demarcay. One molecule of titanic chloride is mixed in small portions with four molecules of absolute alcohol, and the mixture heated to 80°–100° *in vacuo*, when hydrochloric acid and the excess of alcohol are removed and a crystalline mass obtained which has the composition of the chlorhydrate of monochlorhydrine, $Ti(OCl_2H_5)_3Cl_2HCl$. This body forms white crystals, melting at 105°–110°, and decomposable by water. Sodium ethylate dissolved in excess of alcohol is added to an alcoholic solution of the chlorhydrate, when sodium chloride is precipitated, and the alcoholic solution yields on evaporation white crystalline needles of the ether $Ti(OCl_2H_5)_4$.—On the pyruvic ureides: Condensed ureides; by M. E. Grimaux. The author now considers dipyruvic triureide, $C_9H_{12}N_6O_5$; tetapyruvic triureide, $C_{15}H_{14}N_6O_8$; and dipyruvic tetraureide, $C_{15}H_{16}N_8O_7$.—On the shooting stars of November 13 and December 10, 1874, by M. Gruey.—Aérial corpuscles and saline matters contained in snow, by M. G. Tissandier.—Researches on the gastric juice, by M. Rabuteau. The author's experiments confirm the results obtained by Bracconot, Prout, Lassaigne, and Schmidt—that the acidity of the juice is due to hydrochloric and not to lactic acid.—On the nature of syphilitic affections, and on mercurial treatment, by M. J. Hermann.

BOOKS AND PAMPHLETS RECEIVED

BRITISH.—The Microscope and its Revelations: Wm. B. Carpenter, M.B., LL.D. (J. and A. Churchill).—The Apparent Absence of Air and Water from the Moon: Francis Raper (Philosophical Society of Glasgow).—Some Reasons for doubting the Alleged Transit of Venus (Hodder and Stoughton).—Report of the Kew Committee, for year ending Oct. 31, 1874.—Remarks on the Great Logarithmic and Trigonometrical Tables computed in the Bureau du Cadastre under the direction of M. Prony: Edward Sang.—A Short History of the English People: Rev. J. R. Green, M.A. (Macmillan and Co.).—The Amazon and Madeira Rivers: Franz Keller (Chapman and Hall).—Chemical and Geological Essays: T. Sterry Hunt, LL.D. (Trübner).—The Transit of Venus: its Meaning and Use: T. H. Rudd, F.R.A.S. (Longmans).—Two Years in Peru, with Exploration of its Antiquities: Thos. J. Hutchinson, F.R.G.S., F.R.S.L., M.A., &c. (Sampson Low, Marston, Low, and Searle).

AMERICAN.—Report of the Commission of Fish and Fisheries of the United States 1872–73 (Washington).—Memoirs of Boston Society of Natural History: The Species of Lepidoptera Genus *Pamphila*: Samuel H. Scudder (Published by the Society).—Report of the Medical Commission upon the Sanitary Qualities of the Sudbury, Mystic, Shawstone, and Charles River Waters (Boston, Rockwell and Churchill).—Results derived from an Examination of the United States Weather Maps for 1872–73: Elias Loomis (From American Journal of Science and Arts).—Jeffries Wyman Memorial Meeting of the Boston Society of Natural History.

COLONIAL.—Appendix to New Vegetable Fossils of Victoria: Baron Ferd. von Mueller, C.M.G., M.D., Ph.D., F.R.S.—Journal of the Asiatic Society of Bengal (G. H. Rouse, Calcutta).—Proceedings and Transactions of the Nova Scotian Institute of Natural Science (Wm. Gossip, Halifax, N.S.).—Durability of New Zealand Timber (Report read by Mr. Thomas Kirk).

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